

Gluten Free Diets

School Nutrition



Brenda Burgin Ross, MS, RD, LDN
NCDPI School Administrator Annual Conference
Durham, NC
October 2015

Allergies, Intolerances, Sensitivity and Adverse Reactions to Food

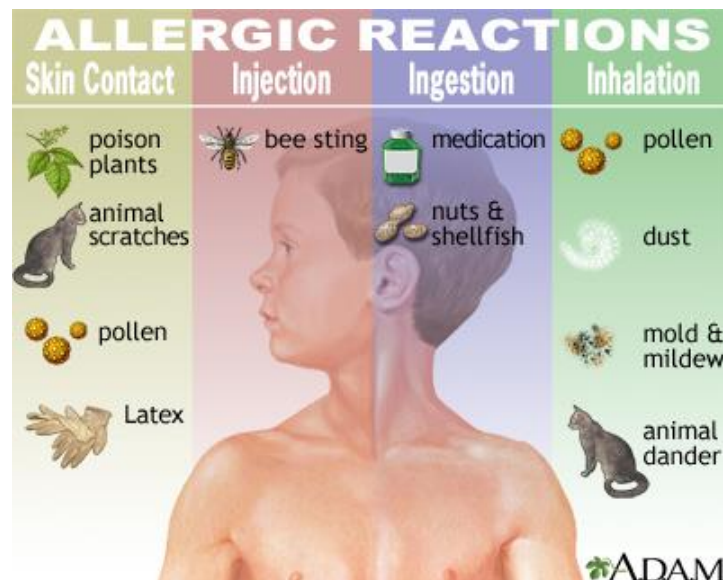
Called “allergic reaction” but are different events, with different causes

- **Adverse Food Reaction:** an reaction to something ingested, can include allergy, intolerance, or food sensitivity
- **Food Allergy:** adaptive immune system response to a component in food, includes **celiac disease** or “**gluten intolerance**”
- **Food Intolerance:** lack of enzyme to break down food, such as **lactose intolerance**
- **Food Sensitivity:** unpleasant reaction to food, including nausea, reflux.
 - Not same mechanism as allergy

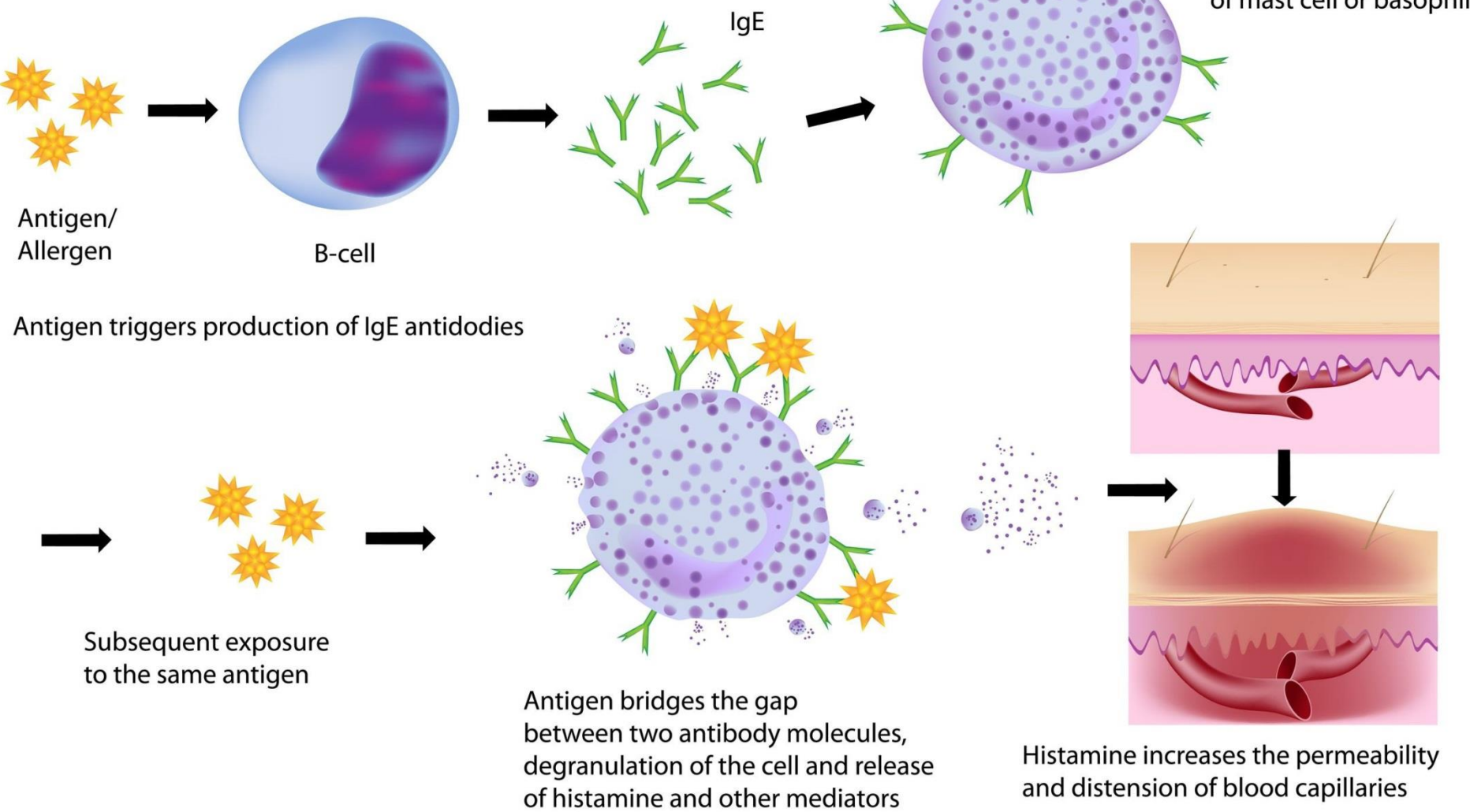


Food Allergies

- **Reaction of the body to an “allergen”**
 - Affect 8% of children, 3% of adults
 - **Allergen** (pollen, food, dust mites, mold, spores) is treated as something harmful & dangerous to body
 - Body sets up **protective response by immune system**

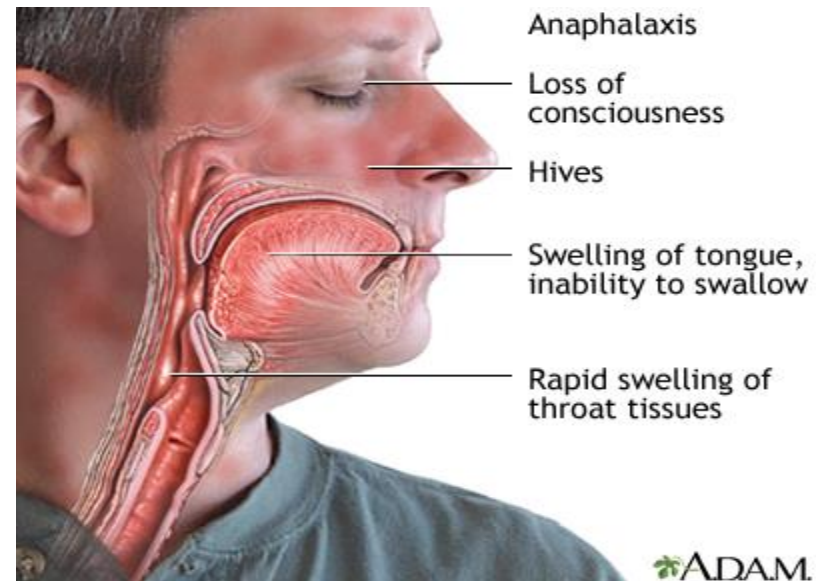


Allergic Reaction



Food Allergies

- **Typical allergic responses include:**
 - Skin rash or eczema
 - Swelling of tongue and throat
 - Congestion
 - Itching, watery eyes
 - Cramping, nausea, diarrhea, vomiting
 - Drop in blood pressure
 - **Anaphylaxis in severe cases**



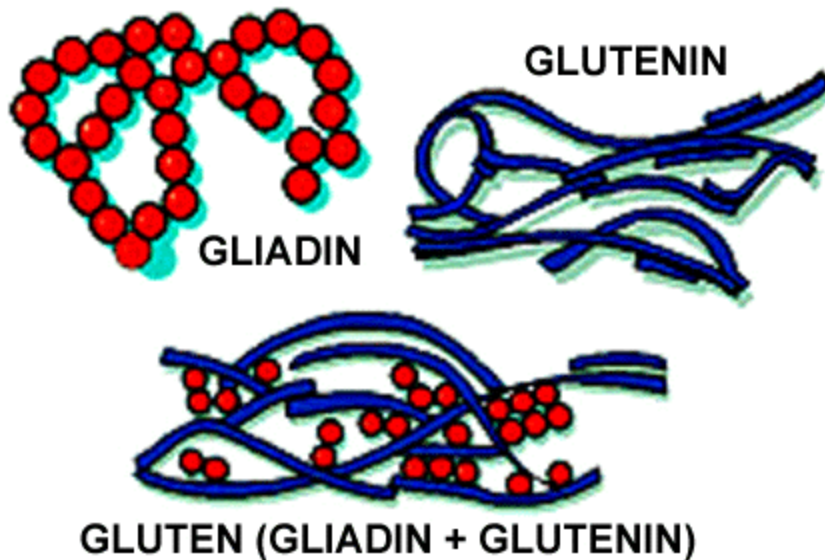
Foods Often Involved in Food Allergies

- Milk
- Eggs
- Ground nuts or peanuts
- Tree nuts such as walnuts, cashews, pecans, etc.
- Soy
- Fish
- Shellfish
- Wheat: glutenin, gliadin, albumin, globulin
 - Four proteins in wheat



Celiac Disease or Gluten Intolerance

- **Two proteins in wheat**
 - **Glutenin and Gliadin combine to form gluten**
 - Gives elasticity to bread products
 - Involved in celiac disease



Celiac Disease or Gluten Intolerance

- **Non-Celiac Gluten Sensitivity**

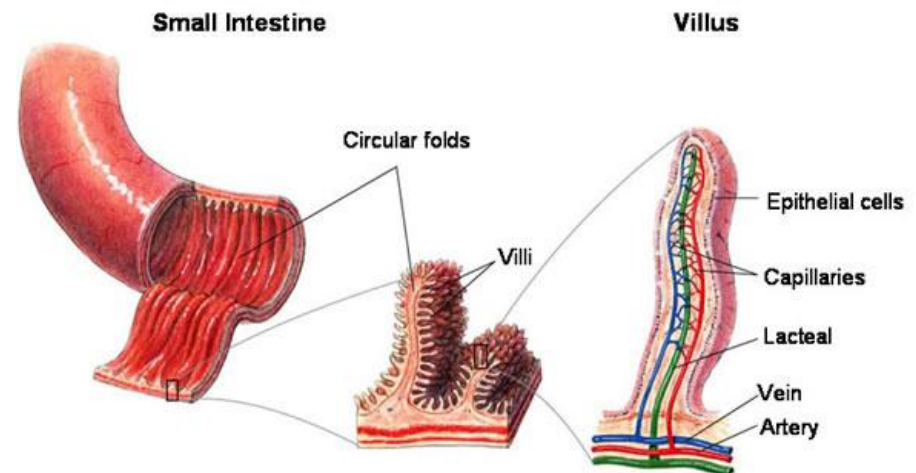
- 6% of population
- Have reaction to gluten, may show some symptoms
- Do not produce same anti-bodies
- Do not suffer damage to intestinal tract
- Does not seem to produce malabsorption
- May still have link to loss of bone mass

- **May benefit from diet restrictions**



Celiac Disease or Gluten Intolerance

- **Inherited disease**
 - Affects 1% of population or > 3 million Americans
 - No cure but can be managed
- **Immune response to gluten**
 - Immune response attacks villi lining small intestine
 - Over time destroys villi leading to malabsorption
- **Diagnosed by blood test and biopsy**
 - Never “self-diagnose”
 - If biopsy being done should NOT avoid gluten prior to biopsy



Celiac Disease Implications

- **No typical symptoms**
 - No cure but can be managed
- **Inflammation of small intestine**
- **Villi damage, atrophy, destruction**
 - Malnutrition
 - Weight loss
- **Villi rebuild and nutrient absorption returns after following strict diet**
- **Lactose intolerance can occur concurrently**
 - Lactase produced in tip of gut villi



Celiac Disease Implications

- **May affect brain development**
- **Failure to thrive in children**
- **Can impact blood sugar regulation**
- **Impacts bone health**
- **Impacts thyroid function**
 - Secondary hyperparathyroidism can occur
 - Lowers blood levels of calcium
- **Impacts immune system overall**



Celiac Disease Management & Treatment

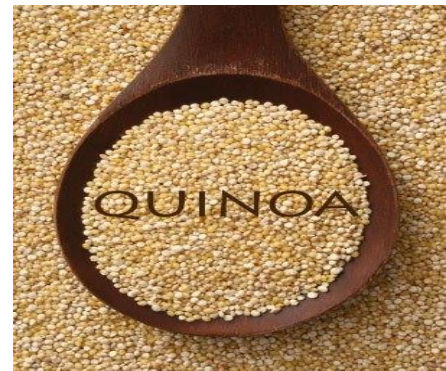
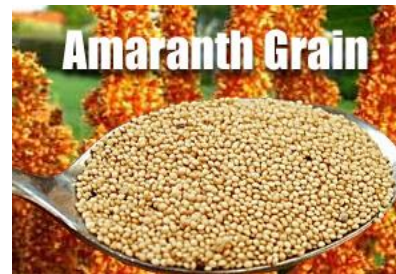
Foods to Avoid

- Wheat
- Barley
- Rye
- Kamut & Spelt
- Malt
- Brewers yeast
- Oats not labeled gluten free
- Wheat derivatives
 - Dextrin
 - Food starch & modified food starches



Wheat Alternatives (OK)

- Rice
- Amaranth
- Arrowroot
- Buckwheat
- Corn, Millet, Cornmeal
- Potato & Sweet Potato
- Gluten Free Oats (must be labeled as such)
- Potato starch
- Sorghum



Hidden Sources of Gluten

- Salad dressings
- Soy sauce
- Marinades
- Pre-made seasonings
- Modified food starches
- Natural or artificial flavorings
- Worcestershire sauce
- Soups
- Canned foods
- Snack foods
- Anything breaded or fried
- Bouillon cubes & bases
- Cheese spreads
- Chocolates with malt flavoring
- Dry sauce mixes
- MSG



Celiac Disease Management & Treatment

- Bread and bread products made from wheat!
- Other products from wheat: hydrolyzed wheat protein, barley malt
- Crackers, cereals made from wheat
- Chips pretzels
- Pasta and noodle products
- Cakes, pies, cookies made with wheat flour
- Soups, including broth types
- Soy sauce, ketchup, mustard, Worcestershire Sauce, BBQ sauce, salad dressings, marinates, glazes
- Many beverages, including root beer and powdered drink mix
- Breaded meats, poultry or fish products
- Gravies and sauces
- Puddings and some yogurts, ice creams (modified food starch)



Cross Contact Potential

- **Can occur in food processing**
 - Cereal and grain processing for breads, cereals, and other items
- **Can occur in commercial kitchens**
 - Mixers, mixing bowls, utensils
 - Cutting boards, counter tops
 - Toasters, utensil drawers
 - Towels and linens
 - Fryers, ovens
 - Flours in air



Commercial Products Available

- **King Arthur GF Flour & Baking Mixes**
 - Not a bad product but does have some aftertaste
 - May or may not work with all products
 - May need Xanthan Gum or Guar Gum added
 - Fat may need to be reduced
- **Bob's Red Mill**
 - Strong aftertaste from garbanzo beans
 - May or may not work with all products
 - May need Xanthan Gum or Guar Gum added
 - Fat may need to be reduced
- **Other commercial GF flours in stores**
- **Bisquick GF biscuit and pancake mix**



Generalized Cooking Tips

- **May need a leavening agent added**
 - Baking soda, baking power or yeast increased or added
- **Consider a binder**
 - Xanthan gum, guar gum, psyllium powder
- **Add protein for browning**
 - Eggs, egg whites, milk powder, soy milk, calcium carbonate (unlocks proteins in rice flour) and even sugar may help
- **Liquid may need to be adjusted**
- **“Rest” the dough or batter**
- **Extend the baking time**



Comparison of Commercial and Homemade GF Flours

Bob's Red Mill Flour	King Arthur GF Flour	ATC Homemade GF Blend
Components	Components	Components
Garbanzo bean flour Potato starch Tapioca flour Sorghum flour Fava bean flour	White rice flour Tapioca flour Potato starch Brown rice flour Calcium carbonate	White rice flour Brown rice flour Potato starch Tapioca starch Non-fat dry milk

Other Thoughts

- Read Labels
- Work with school nurse
- Involve RD & county director
- Know Individual health plan
- Work with parents



Whole grain wheat is —
listed under Ingredients

INGREDIENTS: WHOLE GRAIN WHEAT, CINNAMON, MOLASSES, SUGAR, SALT, TRISODIUM PHOSPHATE, BHT ADDED TO PRESERVE FRESHNESS.

VITAMINS AND MINERALS: VITAMIN C (SODIUM ASCORBATE), CALCIUM CARBONATE, IRON AND ZINC (MINERAL NUTRIENTS), A B VITAMIN (NIACINAMIDE), VITAMIN B₆ (PYRIDOXINE HYDROCHLORIDE), VITAMIN D₃, VITAMIN B₂ (RIBOFLAVIN), A B VITAMIN (FOLIC ACID), VITAMIN B, THIAMIN MONONITRATE), VITAMIN A (PALMITATE), VITAMIN B₁₂

Allergy Statement

CONTAINS WHEAT INGREDIENTS

Recommended Cookbooks

- “The How Can It Be Gluten Free Cookbook”, America’s Test Kitchen, from AmericasTestKitchen.com. 800-611-0759
- “Fast and Simple Gluten Free” by Gretchen Brown. RD
- “Gluten-Free 101: The Essential Beginner’s Guide to Easy Gluten Free Cook”, Carol Fenster, www.CarolFensterCooks.com.
- “100 Best Gluten-Free Recipes”, Carol Fenster
- “Gluten-Free, Hassle-Free”, Marlisa Brown, MS, RD

Resources

- **National Foundation for Celiac Awareness**
 - www.CeliacCentral.org
 - www.SeriouslyCeliac.org
- **Celiac Support Association**
 - www.csaceliacs.org
- **FAN: Food Allergy & Anaphylaxis Network**
 - www.foodallergy.org

